Tomato virus symptoms present at the time *Ageratum yellow vein virus* “AYVV” was detected.

**Stunting**

**Yellowing and Interveinal chlorosis**

**Leaf curling**

Two week grow-out of ‘Season Red’ cherry seedlings from transplant tray. The transplant with severe symptoms failed to grow (left). Transplant with moderate symptoms had slight growth (middle). Transplant with no symptoms produced a normal size plant (right).

Commercial varieties offer resistance to Guam’s tomato viruses.

### Positive test results for four tomato sample collected on 12/29/16 in Yona, Guam

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Leaf Symptoms</th>
<th>Cmm</th>
<th>CMV</th>
<th>ToMV</th>
<th>TBSV</th>
<th>PVY</th>
<th>AYVV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yellowing</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Yellowing</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Yellowing</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Purpling</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Samples were positive for: Cmm *Clavibacter michiganensis*, CMV *Cucumber mosaic Virus*, ToMV *Tobacco mosaic virus*, TBSV *Tomato bushy stunt virus*, PVY *Potato virus X*, and AYVV *Ageratum yellow vein virus*.


## Acknowledgements

Authors would like to thank Drs. R. Muniappan, G. Wall, L. Yudin for adding to the early Guam tomato virus literature. We are appreciative of S. R. Juszczak, Deb Groth-Helms, and others at Agdia incorporated. Authors would like to thank growers John Mesa, Vicente Valaquex, Mark Pieper, and Bernard Watson for providing access to their farms and cropping histories and current and past extension personnel at the University of Guam: J Bamba, J. Afaisen, R. Brown, S. Tareyama, M. Borga, and V. Santos.

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## Disclaimer

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## References


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### Survey and Identification of Viruses Infecting Tomato Crops in Guam

**Robert L. Schlub**¹, **Mari Marutani**¹, **Chellappan Padmanabhan**², **Zhangjun Fei**³ and **Kai-shu Ling**²

¹University of Guam, Mangilao, GU 96923 ²USDA ARS US Vegetable Lab, Charleston, SC 29414 and ³Boyce Thompson Institute, Ithaca, NY 14853

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**Introduction**

In the past 40 years, several viruses have been identified on tomatoes in Guam; however, only with the introduction of new begomoviruses has production been impacted. In 2007, viral disease-like symptoms, including mosaic, leaf curl and chlorosis were associated with losses as high as 20% in some fields of ‘Solar Set’ tomatoes.

In 2011, typical viral symptoms of leaf curling, chlorosis and stunting were associated with total field losses of the variety ‘Season Red’. Surprisingly the occurrence and severity of these symptoms in Season Red have decreased in recent years, while simultaneously symptoms like mosaic, leaf curl and chlorosis were associated with losses as high as 10% in ‘Sweet City’ tomatoes.

Viral disease-like symptoms produced a wide range of symptoms including mosaic, leaf curling and chlorosis impacting production. Further characterization in 2013 determined it to be a unique strain of *Ageratum yellow vein virus* (AYVV) with the highest nucleotide sequence identity of 90-91% to several isolates of AYVV from China (Accession no. FJ869908), Japan (AB306314), Taiwan (DO866134), and Thailand (JN809821). Second highest identity was less than 90% to *Ageratum yellow vein China virus* (AYVCNV) from China (AJ558120 and AJ849916) and the Philippines (EU487045). Additional analysis using deep sequencing of small RNAs and virus identification (Li et al., 2012; Zheng et al., 2017) using samples collected in 2013 to 2015, identified the presence of *Potato virus Y* (PVY), *Southern tomato virus* (STV), *Tobacco streak virus* (TSV), Tomato bushy stunt virus (TBSV), and Tomato spotted wilt virus (TSWV). The association of viruses like symptoms with yield losses, has led us to believe a range of viruses are interacting production.

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**Tomato virus symptoms present at the time *Ageratum yellow vein virus* “AYVV” was detected.**

- Stunting
- Yellowing and Interveinal chlorosis
- Leaf curling

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**References**